EVALUATION OF HDPE NETS PERFORMANCE IN MICRO WIND TUNNEL

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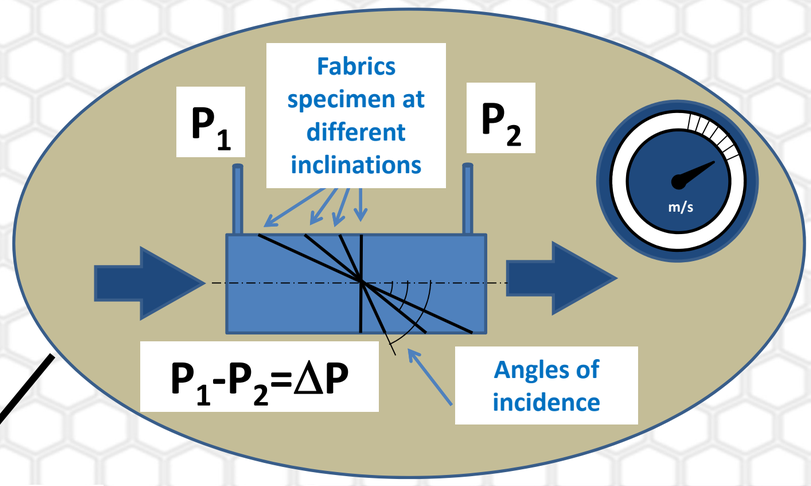
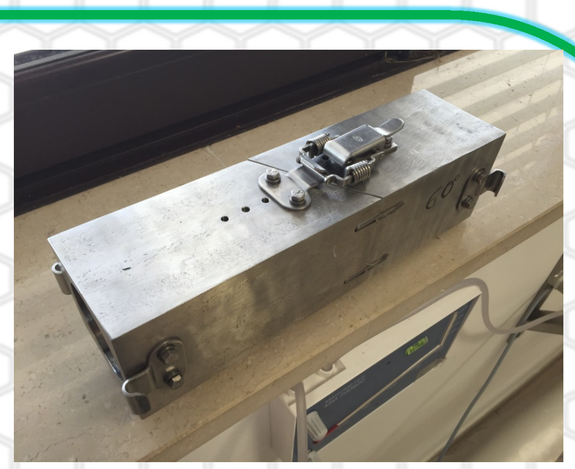
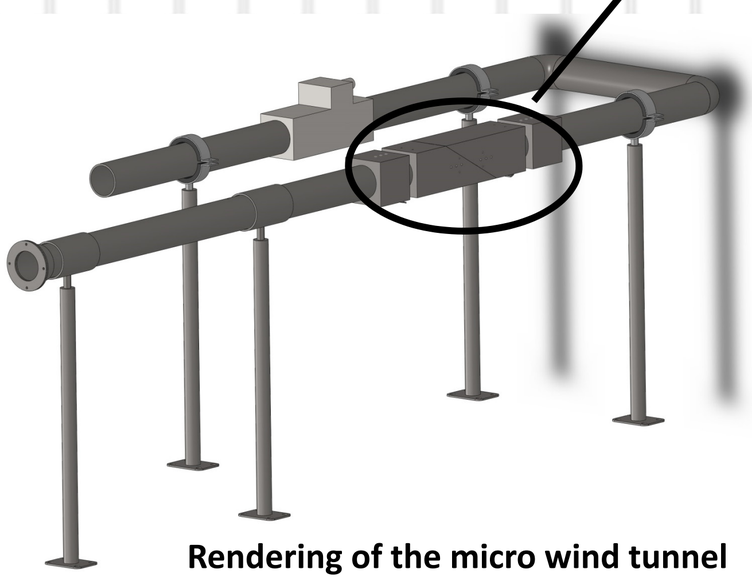
Experimental set up

Micro wind tunnel





Specimen holder with an inclination of the net sample of 60°

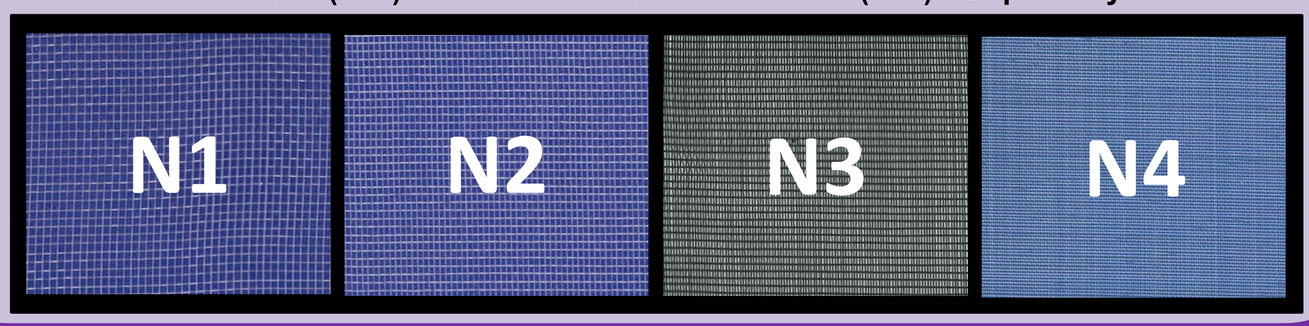


Rendering of the micro wind tunnel

Tested nets

Net Id.	T_{warp}	T_{weft}	d_{warp}	d_{weft}	ε
N1	0,28	0,28	1,39	1,72	71,6%
N2	0,28	0,28	0,97	1,54	65,7%
N3	0,28	0,28	0,35	1,54	47,0%
N4	0,28	0,28	0,27	0,49	34,4%

Tab.1- "T" thickness (mm). "d" distance between threads (mm). "ε" porosity of the net.



Results

All tested nets highlighted a second order correlation between the air velocity- v (m/s)- into the wind tunnel and the pressure drop- ΔP (Pa) (Fig. R1). The loss coefficient except for the term ρ/2 was expressed by the coefficient "a*".

$$\Delta P = a^* v^2$$

The function of porosity best correlating "a*" coefficient was $h(e)=1-\varepsilon^2/\varepsilon^2$ (Fig. R2).

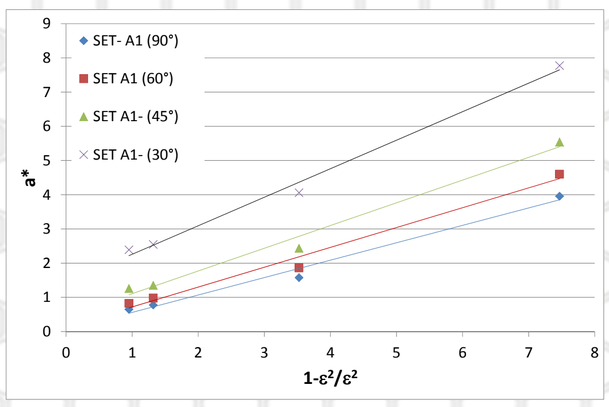


Fig.R2- Correlation between the function of the porosity $h(e)=1-\varepsilon^2/\varepsilon^2$ and the coefficient a* for different inclination of the samples.

The loss coefficient of a net tilt of an angle θ with respect to the air flow (a^*_θ) depends on the loss coefficient of the net perpendicular to the flow (a^*_{90}) and on function of the approach angle of the flow $g(\cos^2\theta)$.

$$a^*_\vartheta = a^*_{90}\, g(cos^2\theta)$$

$$g(cos^2\theta) = (cos^2\theta)^{-1.35\varepsilon}$$

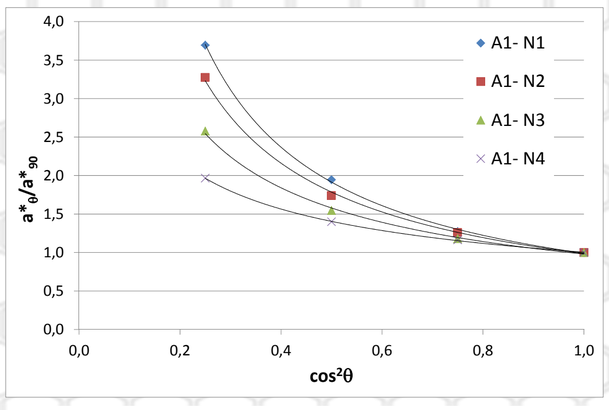
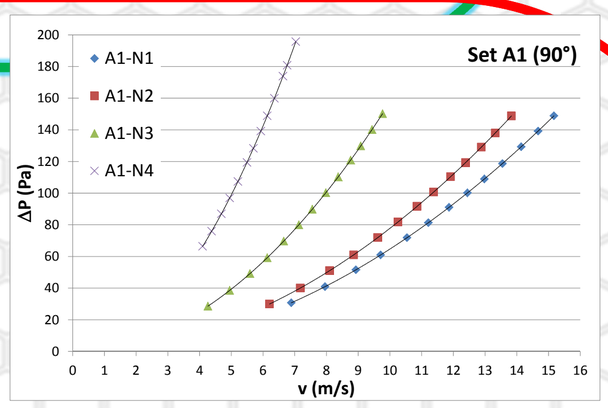
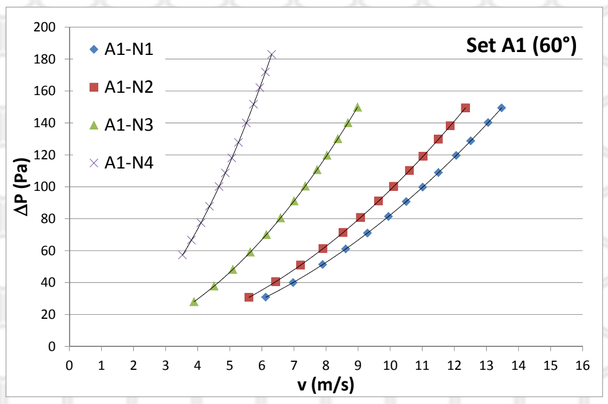
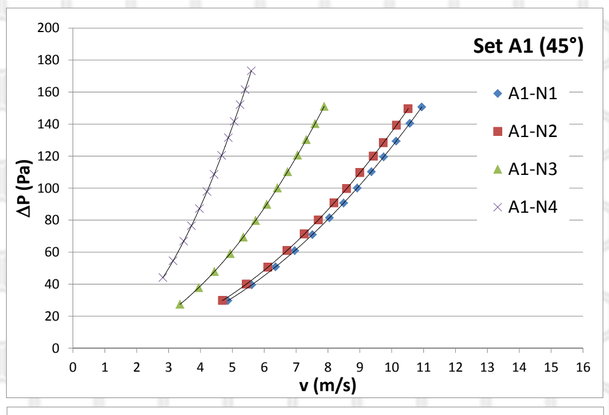


Fig.R3- Correlation between the $\cos^2\theta$ and the normalized value of the loss coefficient, a^*_θ/a^*_{90},.







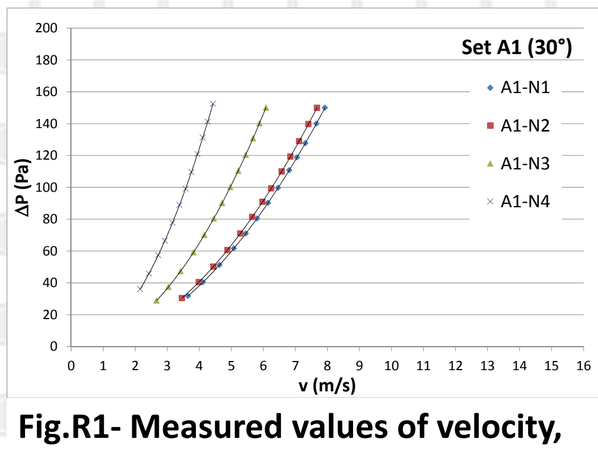


Fig.R1- Measured values of velocity, v(m/s), and pressure drop, Δp (Pa),

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